

Palladium plating bath DEKOR NF

Instructions for use

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Product description

Palladium plating bath DEKOR NF is a neutral palladium plating bath, suitable for depositing nickel-free palladium coatings up to a coating thickness of 0.3 µm. It can be electroplated without an intermediate layer directly on silver, copper, bronze or brass.

The deposited coatings are suitable for use on jewellery, watch cases, glasses, writing implements and other decorative uses, especially if these need to be entirely free of nickel. *Palladium plating bath DEKOR NF* can be used both for barrel and jig plating applications.

Layer properties

Coating:	palladium
Colour:	bright, shiny
Max. layer thickness:	0.3 µm
Hardness:	ca. 230–250 HV
Density:	12 g/cm ³

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Palladium plating bath DEKOR NF	(6 g Pd/l)	Art. No. 86911200
Palladium plating bath DEKOR NF, 1 l	(6 g Pd/l)	Art. No. 81020432
Make-up concentrate DEKOR NF A		Art. No. 86939122
Palladium complex	(100 g Pd/l)	Art. No. 81014727
Regeneration solution DEKOR NF R1, 100 ml		Art. No. 86939120
Regeneration solution DEKOR NF R2, 400 ml		Art. No. 86939121
Conducting salt DEKOR NF L		Art. No. 81010166

Equipment

Anode material:	platinised titanium
Anode/cathode ratio:	2:1 (anode/cathode surface size)
Heating:	heating element made of quartz glass or PTFE
Tank material:	PPH
Bath filtration:	required
Movement of cathode rod:	required
Exhauster:	recommended

Bath make-up

Make-up chemicals

Bath chemicals for 1 l *Palladium plating bath DEKOR NF (3 g Pd/l)*:

- 600 ml *Make-up concentrate DEKOR NF A*
- 30 ml *Palladium complex*
- 370 ml Deionised water (< 10 µS)

Bath chemicals for 1 l *Palladium plating bath DEKOR NF (6 g Pd/l)*:

- 600 ml *Make-up concentrate DEKOR NF A*
- 60 ml *Palladium complex*
- 340 ml Deionised water (< 10 µS)

Procedure

Into a thoroughly cleaned tank the quantity of deionised water required for the desired bath volume is filled. Now the appropriate quantities of *Make-up concentrate DEKOR NF A* and *Palladium complex* are slowly put into the water. The solution must be stirred until all make-up chemicals have fully mingled with each other. Then the make-up solution is heated up to

the operation temperature and its pH-value is measured. If necessary, the pH-value is raised to 6.5–7.5 by adding 10% ammonia solution. If the pH-value is too high, the make-up solutions is to be kept at a temperature above 50 °C until enough ammonia has escaped. Afterwards the bath is ready for use.

Process overview

Prerequisite for a strongly adhesive palladium plating is an intensive pre-treatment of the surface. This should be carried out using an ultrasonic cleaning bath made-up with *Ultrasonic cleaning concentrate ULTRA 3000*, *Electrolytic degreasing bath Type A* and finally an acid dip treatment in 10% sulphuric acid solution acid or in Acid Dip Bath S. Multistate rinsing is required after operation of each of the respective process baths. The last rinsing step before palladium plating should be performed in deionised water.

Process parameters

Bath temperature:	55–60 °C
Voltage:	1–2 V (suitable voltage for nominal current density depending on surface size to be plated, lower voltage for smaller surfaces, higher voltage for larger surfaces)
Current density:	0.8–1.5 A/dm ²
Deposition rate:	ca. 0.07 µm/min
Deposition weight:	ca. 20 mg/Amin

The last rinsing step after the galvanic coating with *Palladium plating bath DEKOR NF* should be performed in 60–80 °C hot deionised water for 10–20 s. This treatment intensifies the colour of the palladium deposition.

Bath control and regeneration

The palladium plating bath should be kept at optimum conditions by regularly replenishing the solution. This requires regular additions of *Palladium complex*, *Regeneration solution DEKOR NF R1* and *Regeneration solution DEKOR NF R2*.

The bath should be regenerated based on analysis results. The second option is monitoring the metal consumption by using an ampere-minutes-counter and regenerating the bath accordingly. However, regular analytical control is still required.

Under optimum operating conditions, 100 g of palladium metal are deposited per 5,000 A/min. In order to avoid problems caused by too high metal loss small, regular additions should be made every time the palladium concentration has dropped below 80% of the original value.

In case of larger bath volumes we recommend adding the following materials every 5,000 Ah:

- 1 l *Palladium complex*
- 100 ml *Regeneration solution DEKOR NF R1*
- 400 ml *Regeneration solution DEKOR NF R2*

After adding the regeneration solutions the bath is mixed well and the pH value is checked and adjusted if necessary. The pH-value must be checked after each addition. In order to increase the pH-value, 10% ammonia solution must be added to the bath gradually while stirring. If the pH-value is too high the bath should be kept at a temperature above 50 °C until enough ammonia has escaped. It is useful to check the pH-value daily before starting work.

Bath parameters

Palladium content:	3–6 g/l
pH value:	6.5–7.5
Bath density:	1.06–1.07 g/ml (8–10 °Bé)

On request we conduct regular analyses in our application technology laboratory and issue individual regeneration advices. For this service we require per each bath 100 ml of it as probe for a standard analysis or 1 l in case of problems.

Hazard information, storage, disposal

The occupational safety measures and regulations specified in the material safety data sheet must be observed.

The bath chemicals must be stored sealed and separately from food in suitable and labelled containers.

Waste water must be treated before the aqueous solution can be emptied into the drains. Please observe the regulations of the competent local water authorities.

*The information on our product and the method are based on intensive research and technical experience of this application.
We provide these results to the best of our knowledge and reserve the right to make technical changes in the course of product development.*

*However, this does not relieve the user of their responsibility to check our specifications for their own use before application.
If you have any questions or would like a consultation, please contact our application technology service department at any time.
We would also be happy to discuss our further electroplating product range.*